MIXED EXTRAGONADAL GERM CELL TUMOR OF THE ADULT LATERAL NECK

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BACKGROUND

Extragonadal germ cell tumors (EGCT) rare cancers that arise in tissue outside of the gonads.[1] Most cases of extragonadal GCT have been reported in the mid-axis of the body: anterior mediastinum (50-70%), retroperitoneum (30-40%), as well a a few instance involving the pineal gland and sacrococcygeal region.[1] In adults, over 90% of cases of malignant EGCT affect males ages 20 – 35,[4] with an estimated incidence of 1/1,000,000 to 2/1,000,000. [2]

Mixed GCT are histologically defined as being composed of more than one type of GCT.[3] Most cases of EGCT in the head and neck regions have been teratomas involving the thyroid gland[1] and to our knowledge this study documents the first mixed EGCT of the adult lateral neck, illustrating the unique pathology and management outcome of this exceptionally rare disease entity.

CASE REPORT

A 52-year-old male with history of alcoholic cirrhosis presented with a rapidly growing and painless mass on his left neck. Computed tomography of the neck with contrast showed a complex level II lymph node measuring 5 cm x 2.5 cm (Figure 1). Ultrasound-guided fine needle aspiration revealed a poorly differentiated carcinoma with neuroendocrine features and PET/CT (Figure 2) did not show any evidence of distant metastasis outside of the neck.

The mass was removed with surgery along with ipsilateral lymph node dissection of levels II through IV, without complications. Histologic examination by our pathology department classified the tumor as a mixed germ cell tumor containing substantial amounts of yolk sac tumor, primitive neuroectodermal tumor (PNET), large cell neuroendocrine carcinoma, and basaloid squamous cell carcinoma along with limited amounts of teratoma and embryonal carcinoma (Figure 3 and Figure 4). Only one of thirteen lymph nodes were positive for disease.

Post-operatively, a scrotal ultrasound performed by urology was normal and tumor markers for GCT, including human chorionic gonadotrophin (β-HCG) and alpha-fetoprotein (AFP), were all within normal limits. The case was discussed in a multidisciplinary tumor board and medical oncology recommended against adjuvant chemotherapy due to this patient's advance cirrhosis. Ultimately, it was decided to closely monitor this patient with regular long-term cancer surveillance.

Figure 1: CT neck with contrast, axial cut showing left level II lymph node.

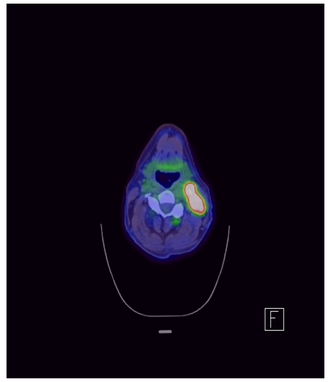

Figure 2: PET/CT, axial cut showing an FDG-avid left level II lymph node.

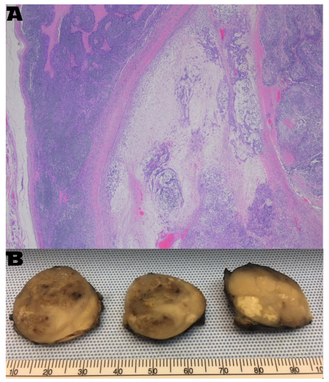

Figure 3: Histologic (A) and gross (B) sections showing a lymph node involved by a heterogeneous mixed germ cell tumor.

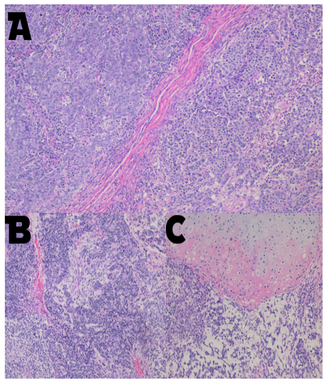

Figure 4: Histology demonstrating different components of the mixed germ cell tumor. (A) Basaloid squamous cell carcinoma (left) and large cell neuroendocrine carcinoma (right). (B) Primitive neuroectodermal tumor. (C) Immature teratoma (top) and yolk sac tumor (bottom).

DISCUSSION

EGCT in the head and neck area are extraordinarily rare and very limited information is currently available regarding their management. Initial workup should include imaging with computed tomography with contrast, biopsy of the lesion, and PET/CT to establish the diagnosis and extent of disease.

In cases where germ cell tumors are confirmed or suspected β-HCG and AFP tumor marker levels should be obtained, since they are associated with different subtypes and can guide diagnosis, disease surveillance, and therapy efficacy.[6,7] β-HCG is produced by choriocarcinoma, embryonal carcinoma, and a minority of seminomas. Whereas serum AFP levels are elevated in yolk-sac tumors and embryonal carcinoma.[7] Tumor markers CEA and CA 19-9 may also be useful makers to monitor disease progression.[7] Germ cell tumor found in an extragonadal location is considered metastatic until a gonadal primary is ruled out with a testicular exam, scrotal ultrasound, and other imaging modalities such as PET/CT.[3,8]

Currently, the standard treatment approach for this group is first-line chemotherapy. Persistent disease or relapses are either managed with second-line chemotherapy, surgical resection, or both.[10-11] Most commonly used chemotherapeutic agent included Bleomycin, Etoposide, and Cisplatin.[6,12,13] Further studies are necessary to establish the appropriate chemotherapeutic regimen and to determine the role of radiation therapy to treat each type of EGCT.

REFERENCES

1. Busch J, Seidel C, Zengerling F. Male Extragonadal Germ Cell Tumors of the Adult. *Oncol Res Treat*. 2016;39(3):140-144. doi:10.1159/000444271
2. Pauniaho S-L, Salonen J, Helminen M, Vettenranta K, Heikinheimo M, Heikinheimo O. The incidences of malignant gonadal and extragonadal germ cell tumors in males and females: a population-based study covering over 40 years in Finland. *Cancer Causes Control*. 2012;23(12):1921-1927. doi:10.1007/s10552-012-0069-9
3. Shinagare AB, Jagannathan JP, Ramaiya NH, Hall MN, Van Den Abbeele AD. Adult extragonadal germ cell tumors. *Am J Roentgenol*. 2010;195(4):274-280. doi:10.2214/AJR.09.4103
4. Gao Y, Jiang J, Liu Q. Extragonadal malignant germ cell tumors: a clinicopathological and immunohistochemical analysis of 48 cases at a single Chinese institution. *Int J Clin Exp Pathol*. 2015;8(5):5650-5657.
5. Devaney KO, Ferlito A. Yolk sac tumors (endodermal sinus tumors) of the extracranial head and neck regions. *Ann Otol Rhinol Laryngol*. 1997;106(3):254-260. doi:10.1177/000348949710600315
6. Filho BCA, McHugh JB, Carrau RL, Kassam AB. Yolk sac tumor in the nasal cavity. *Am J Otolaryngol - Head Neck Med Surg*. 2008;29(4):250-254. doi:10.1016/j.amjoto.2007.09.001
7. Eickhoff B, Jaehne M, Langer F. Extragonadal germ-cell tumor: A rare differential diagnosis of a cervical lump in a young man. *Ear, Nose Throat J*. 2002;81(8):580-582. doi:10.1177/014556130208100822
8. Wierzbicka-Chmiel J, Chrószcz M, Słomian G, et al. Mixed germ cells tumour primarily located in the thyroid - A case report. *Endokrynol Pol*. 2012;63(5):388-390.
9. International Germ Cell Consensus Classification: a prognostic factor-based staging system for metastatic germ cell cancers. International Germ Cell Cancer Collaborative Group. *J Clin Oncol*. 1997;15(2):594-603. doi:10.1200/JCO.1997.15.2.594
10. Khurana K, Gilligan TD, Stephenson AJ. Management of poor-prognosis testicular germ cell tumors. *Indian J Urol*. 2010;26(1):108-114. doi:10.4103/0970-1591.61228
11. Hinton S, Catalano PJ, Einhorn LH, et al. Cisplatin, etoposide and either bleomycin or ifosfamide in the treatment of disseminated germ cell tumors: final analysis of an intergroup trial. *Cancer*. 2003;97(8):1869-1875. doi:10.1002/cncr.11271
12. Lukman MR, Jasmi AY, Sarinah B, Nurismah MI, Aishah AS. Malignant cervical teratoma in an adult presenting with impending airway obstruction. *Asian J Surg*. 2005;28(3):227-229. doi:10.1016/S1015-9584(09)60349-3
13. Als C, Laeng H, Cerny T, Kinser JA, Rosier H, Hausler R. Clinical case Primary cervical malignant teratoma with a rib metastasis in an adult : Five-year survival after surgery and chemotherapy. 1998:1015-1022.